

**Patent**

following claims and equivalents thereto.

**CLAIMS**

What is claimed is:

1. A method of producing a supported organic catalyst system comprising the steps of:
  - (a) providing an organic catalyst solution comprising an organic catalyst dissolved in a supercritical-like solvent;
  - (b) contacting a support material with said organic catalyst solution; and
  - (c) removing substantially all of said supercritical-like solvent from said organic catalyst and said support material.
2. The method of claim 1 wherein said organic catalyst comprises a metallocene catalyst.
3. The method of claim 2, wherein said metallocene catalyst comprises a zirconium metallocene compound.
4. The method of claim 3, wherein said zirconium metallocene compound is selected from the group consisting of dichlorobis(n-butylcyclopentadienyl) zirconium (IV), dichlorobis(cyclopentadienyl) zirconium (IV) and mixtures thereof.

5. The method of claim 1 wherein said supercritical-like solvent is a solvent in its supercritical state.

6. The method of claim 1 wherein said supercritical-like solvent comprises a liquid solvent in a subcritical state selected from the group consisting of methane, ethane, ethylene, propylene, trifluorochloromethane, difluoromethane, isomers of tetrafluoroethane, pentafluoroethane, isomers of trifluoroethane, isomers of pentafluoropropane, difluorochloromethane, isomers of tetrafluorochloroethane, carbon dioxide, ammonia, and mixtures of two or more thereof.

7. The method of claim 6 wherein said liquid solvent comprises liquid carbon dioxide.

8. The method of claim 1 wherein said providing step (a) comprises dissolving said organic catalyst in said supercritical-like solvent at a temperature of from about -10°C to about 200°C.

9. The method of claim 8 wherein said providing step (a) comprises dissolving said organic catalyst in said supercritical-like solvent at a temperature of from about 30°C to about 100°C.

**Patent**

10. The method of claim 8 wherein said providing step (a) comprises dissolving said organic catalyst in said supercritical-like solvent at a pressure of from about 25 psia to about 5,000 psia.
11. The method of claim 9 wherein said providing step (a) comprises dissolving said organic catalyst in said supercritical-like solvent at a pressure of from about 100 psia to about 3,500 psia.
12. The method of claim 2, wherein said metallocene catalyst comprises a co-catalyst.
13. The method of claim 12, wherein said co-catalyst is selected from the group consisting of tri-(n-butyl) ammonium tetra bis(pentafluorophenyl) boron, tris (pentafluorophenyl) borane, alumoxane, methylalumoxane and mixtures thereof.
14. The method of claim 1 wherein said porous support is selected from the group consisting of alumina, silica and silica treated with a halogenated organic compound.
15. The method of claim 14 wherein said porous support comprises a plurality of particles.
16. The method of claim 14 wherein said porous support comprises a single

unitary body.

17. The method of claim 1 wherein said removing step (c) comprises converting said supercritical-like solvent to a gaseous state.

18. The method of claim 17 wherein said supercritical-like solvent is converted to a gaseous state by adjusting the temperature of said solvent.

19. The method of claim 17 wherein said supercritical-like solvent is converted to a gaseous state by adjusting the pressure of said solvent.

20. The method of claim 1 further comprising the steps of:

- d. providing a second organic catalyst solution comprising a second organic catalyst dissolved in a supercritical-like solvent;
- e. contacting said porous support material with said second organic catalyst solution; and
- f. removing substantially all of said supercritical-like solvent of said second solution from said second organic catalyst and said support material.

21. The method of claim 20, wherein said organic catalyst solution and said second organic catalyst solution are contacted with said porous support substantially simultaneously.

22. The method of claim 20, wherein said solvent of said second solution is a selective solvent for said second organic catalyst.
23. A polymerization reaction using the catalyst formed from the method of claim 1.
24. A method of producing a supported organic catalyst system comprising the steps of:
- (a) providing an organic catalyst solution comprising an organic catalyst dissolved in a solvent comprising a liquid hydrofluorocarbon solvent;
  - (b) contacting a support material with said organic catalyst solution; and
  - (c) removing substantially all of said hydrocarbon solvent from said organic catalyst and said support material.
25. The method of claim 24 wherein said organic catalyst comprises a metallocene catalyst.
26. The method of claim 25, wherein said metallocene catalyst comprises a zirconium metallocene compound.
27. The method of claim 26, wherein said zirconium metallocene compound is selected from the group consisting of dichlorobis(n-butylcyclopentadienyl) zirconium (IV),

Patent

dichlorobis(cyclopentadienyl) zirconium (IV) and mixtures thereof.

28. The method of claim 25, wherein said metallocene catalyst comprises a co-catalyst.
29. The method of claim 28, wherein said co-catalyst is selected from the group consisting of tri-(n-butyl) ammonium tetra bis(pentafluorophenyl) boron, tris (pentafluorophenyl) borane, alumoxane, methylalumoxane and mixtures thereof.
30. The method of claim 24 wherein said porous support is selected from the group consisting of alumina, silica and silica treated with a halogenated organic compound.
31. The method of claim 30 wherein said porous support comprises a plurality of particles.
32. The method of claim 30 wherein said porous support comprises a single unitary body.
33. The method of claim 24 wherein said hydrofluorocarbon solvent has a surface tension of about 22 dynes per centimeter or less.
34. The method of claim 24 wherein said hydrofluorocarbon contains at least

about 65 weight percent fluorine.

35. A method for producing a supported metallocene catalyst system comprising the steps of:
- (a) providing an organic catalyst solution comprising an organic catalyst dissolved in a first solvent;
  - (b) contacting a support material with said catalyst solution; and
  - (c) removing substantially all of said first solvent by contacting said first solvent with a supercritical solvent and evaporating said supercritical solvent.
36. The method of claim 35, wherein said first solvent is a liquid solvent.
37. The method of claim 35, wherein said removing step (c) further comprises contacting said first solvent with said supercritical-like solvent.
38. The method of claim 35 further comprising the steps of:
- d. providing a second organic catalyst solution comprising a second organic catalyst dissolved in a second solvent;
  - e. contacting said porous support material with said second organic catalyst solution; and
  - f. removing substantially all of said second solvent by contacting said second solvent with a supercritical solvent and evaporating said supercritical solvent.

**Patent**

39. The method of claim 38, wherein said organic catalyst solution and said second organic catalyst solution are contacted with said porous support substantially simultaneously.